# Joint Total Asset Visibility
# 'Coming to a Theater Near You'

**by Maj William L. Taylor**

*JTAV involves the fusing and sharing of logistical data across functional and Service boundaries. Without it, focused logistics is beyond reach.*

Joint Total Asset Visibility (JTAV) is here! It is currently deployed to the Joint Forces Command, the Pacific Command, the European Command, the Central Command, and United States Forces Korea. Under the existing system architecture, vast amounts of asset data, such as inventory, are "pushed," or "pulled," at varying intervals, from "authoritative sources" to servers located at these unified commands. The information can then be accessed, via the World Wide Web, and used by planners at the headquarters level, or operators in the field. Currently underway, is a migration from the "as is" system architecture to the "objective" system architecture, where various middleware solutions are employed to allow for direct access to authoritative source data, thereby, allowing for "on line, near real time"information.

The purpose of this article is to discuss the origin of the Joint Total Asset Visibility (JTAV) concept, define it, identify the documentation mandating the development and implementation of this capability, describe the asset categories inherent in JTAV, and provide a broad overview of the system architecture-broken down between the "as is" architecture, and the "objective" architecture. Finally, information will be provided for those desiring access to the JTAV capability.

## JTAV ORIGINS

In every major deployment of the 20th Century, our forces have been plagued by one constant difficulty, the inability to see assets as they flowed through the logistics pipeline, and into theater. When asset visibility is lost, management becomes difficult, as does the ability to provide "Focused Logistics." Customers, lacking confidence in the system, will submit numerous requisitions for the same item, often abusing the priority system in the process. As a result, superfluous materiel chokes the transportation system, and the cycle continues.

An example of this "asset blindness" occurred in Operations Desert Shield and Desert Storm. During this conflict, over 40,000 containers were shipped to the Middle East. More than 20,000 had to be opened, inventoried, resealed, and reinserted into the transportation system because personnel in theater did not know the contents, or final consignees. When the war finally ended, more than 8000 containers remained to be opened. Additionally, there were 250,000 Air Force pallets whose contents could not be readily identified.

Granted, the result of the logistical effort ensured U.S. and coalition forces were victorious, but such "brute force" logistics, while perhaps effective, is neither efficient, nor desirable. Clearly, there was a need for establishing and maintaining visibility of assets throughout the logistical pipeline. Materiel that is visible in the pipeline will not be lost, customers will gain renewed confidence in the logistics system, and refrain from submitting duplicate requisitions, and the transportation system (perhaps the biggest

beneficiary of JTAV) will not be strangled by excess property. In such a scenario, "Focused Logistics" becomes a possibility. JTAV provides for that scenario.

## WHAT IS JTAV?

Joint Total Asset Visibility is **the capability to provide users with timely and accurate information on the location; movement; status; and identity of units, personnel, equipment, and supplies.** JTAV also facilitates the ability to use that information to improve overall performance of the Department of Defense's (DoD's) logistics practices. Asset visibility represents a fundamental first step, and may subsequently be leveraged to accomplish all those goals of Focused Logistics. One example, is an initiative to provide inter-service visibility of consumable and reparable assets, within a Primary Inventory Control Activity and Secondary Inventory Control Activity (PICA/SICA) relationship. This allows for both lateral re-distribution and procurement offset of assets and the associated cost savings.

As another example, at the operational level, consider the following scenario. You are cruising the Indian Ocean, or training at Ft. Hood, or Langley Air Force Base, when the National Command Authority decides we must head back to the Persian Gulf because Saddam Hussein is "rattling his saber" again. As you are ramping up, you discover the filters to your unit's gas masks are being recalled because of a bad lot number. Would it not be advantageous to keypunch the NSN into your personal computer, and in only

seconds find out who close by or back in CONUS had some replacements? In times past, that could prove difficult to impossible. Today, the answer is literally, at your fingertips.

The JTAV capability remains a work in progress. As it currently exists, it is neither 100 percent joint, or total. It is however, quite robust and useful and represents a "quantum leap" forward from days past. Additional databases are constantly being added, as are significant enhancements, particularly in the in-transit visibility (ITV) area. In EUCOM, where JTAV has been supporting the Bosnia and Kosovo operations of recent years, JTAV has become the "tool of choice" for asset visibility. Likewise, the JTAV capability is on every unified command's (CINC's) integrated priority list.

## SUPPORTING DOCUMENTATION

The emphasis on developing and implementing a JTAV capability is contained in numerous documents. Joint Vision 2010, the Defense Planning Guidance, Quadrennial Defense Review, and the DoD Logistics Strategic Plan, all address the goal of obtaining total asset visibility. The Under Secretary of Defense for Acquisition and Technology has produced a report on *Product Support for the 21st Century* which is actually an implementation strategy, built on the Section 912 (c) Report, *Actions to Accelerate the Movement to the New Workforce Vision,* which was submitted to Congress by Defense Secretary Cohen. Among the topics addressed is Joint Total Asset Visibility. JTAV is also a perfect example of the Clinton Administration's National Performance Review (NPR) objectives of putting customers first, cutting red tape, empowering employees, and

getting back to basics. JTAV puts customers (service members) first by providing answers to questions about assets in the logistics pipeline, and JTAV empowers employees (service members) by providing the necessary information to push decision-making down to the individual (service member) best suited to make the decision.

While all the above mentioned documents are significant, it is Joint Vision 2010 (JV 2010) that highlights the necessity of JTAV. As the introduction to this document states, **JV 2010 is the conceptual template for how America's Armed Forces will channel the vitality and innovation of our people and leverage technological opportunities to achieve new levels in joint war-fighting.** It goes on to develop four operational concepts: Dominant Maneuver, Precision Engagement, Full Dimensional Protection, and Focused Logistics.

The JTAV capability is embedded in the operational concept of Focused Logistics which is defined as follows: **the fusion of information, logistics, and transportation technologies to provide rapid crisis response, to track and shift assets even while en-route, and to deliver tailored logistics packages and sustainment directly at the strategic, operational, and tactical level of operations**.

## ASSET CATEGORIES

Before discussing the system architecture, we need to look at one of the enduring JTAV concepts-that of **asset categories**. These categories are assets "in-storage," "in-transit," and "in-process" (see Figure 1). The astute reader will notice the linkage between these asset categories and that portion of the JTAV definition addressing the **location, movement,** status, and **identity** of units, personnel, equipment, and supplies. These asset categories comprise the logistical pipeline referred to throughout this text. Again, the astute reader will notice the similarity between the logistical pipeline and the "supply chain" inherent in Supply Chain Management. An explanation of these asset categories follows:

**In Storage**-those assets stored at retail supply, wholesale storage, (both ashore and afloat), and disposal activities. They also include inventories held by maintenance activities to support repair, and vendor managed inventories as part of vendor-DoD partnerships. This category encompasses all classes of supply.

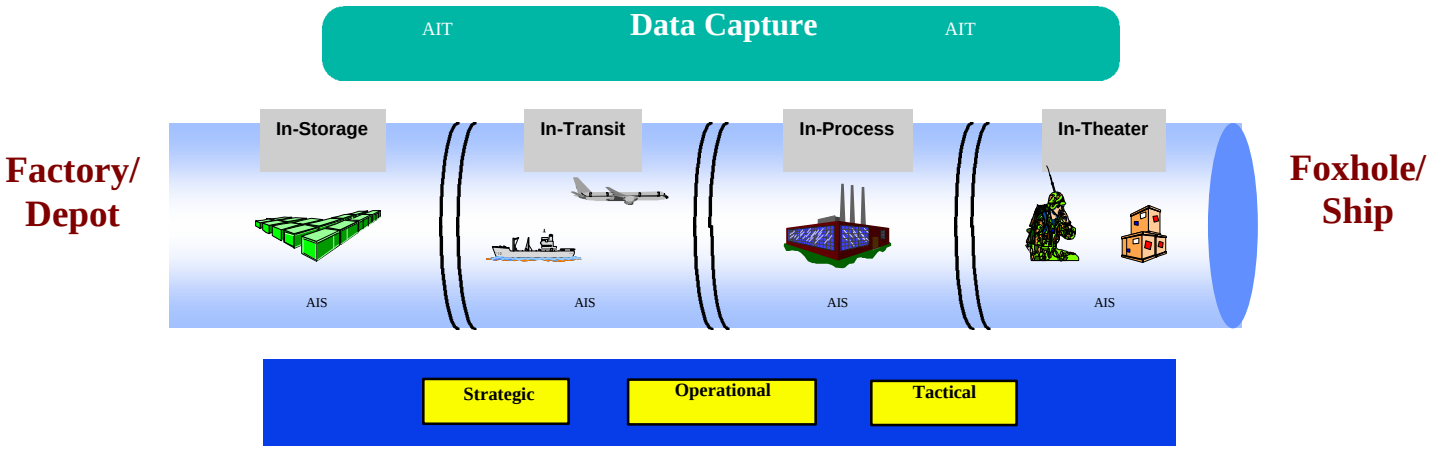


**Figure 1**

**In Transit**-concerns in-transit visibility (ITV) and focuses on the movement of assets from origin to destination. DoD needs to be able to identify the contents of a shipment and monitor its movement throughout the logistics pipeline. DoD also needs the ability to track item, unit, and personnel movements as well as be able to reconstitute and divert shipments.

**In Process**-those assets being procured or repaired. They include assets on order from DoD vendors and not yet shipped as well as some vendor-managed inventories. They also include assets in repair at organic or commercial depot and intermediate-level repair facilities.

## SYSTEM ARCHITECTURES

The essence of JTAV is an integrated data environment. Specifically, JTAV must **access** the authoritative source systems and associated data bases that contain data on the assets in storage, in-transit, or in-process. Then, JTAV must **collect** that data, **fuse** it together, and then **present** that **information** in a useable form to the user. Conceptually, this is fairly straightforward, technically however, it represents a challenge as there are hundreds of logistics automated information systems (AIS's) that cross both functional and service boundaries. While each of these existing systems serves some purpose (i.e. visibility) to an individual service or agency, they represent only "islands of visibility."

The system architecture of JTAV is designed to allow a **single point of entry** into the JTAV world called for in JV 2010.

The JTAV system architecture is the foundation on which the JTAV capability depends. It is a description, including graphics, of systems and interconnections that support functional requirements. It also consists of system overlay diagrams and node descriptions. To fully understand the evolution of JTAV, and the direction it is headed, one must contrast the "as is" system architecture with the "objective" system architecture.

## THE "AS IS" SYSTEM ARCHITECTURE

The "as is" system architecture represents what is currently deployed to the unified commands and is referred to as JTAV-In Theater, or JTAV-IT. It has evolved from a client-server technology, with all the associated limitations, to the more versatile web-based technology. The use of the web-based technology allows for the JTAV capability to support the implementing strategy of the Global Combat Support System (GCSS) and the broader Global Command and Control System (GCCS) as well as an application known as the Common Operating Picture (COP). In essence, the COP is a visual display of the battlefield, to include supporting infrastructure. The GCSS, is essentially the **logistical** input for the command and control activities within GCCS and requires the JTAV capability to be accessible by any user, from any box, and from anywhere.

The "as is" architecture operates as follows. A server located at a central location receives data feeds from any of a number of authoritative sources. The data feeds to the

server arrive at various intervals by means of the standard file transfer protocol (FTP) process. In some cases the data is **pushed** from the authoritative source to the server, and in some cases the data is **pulled** from the authoritative source to the server. Examples of authoritative sources would be the Supported Activity Supply System (SASSY) for Marine Corps retail inventory data, Standard Automated Materiel Management System (SAMMS) for DLA wholesale stocks, and the Global Transportation System (GTN) for in-transit visibility. These authoritative sources, along with other examples are depicted in Figure 2. Figure 3 shows the server locations.

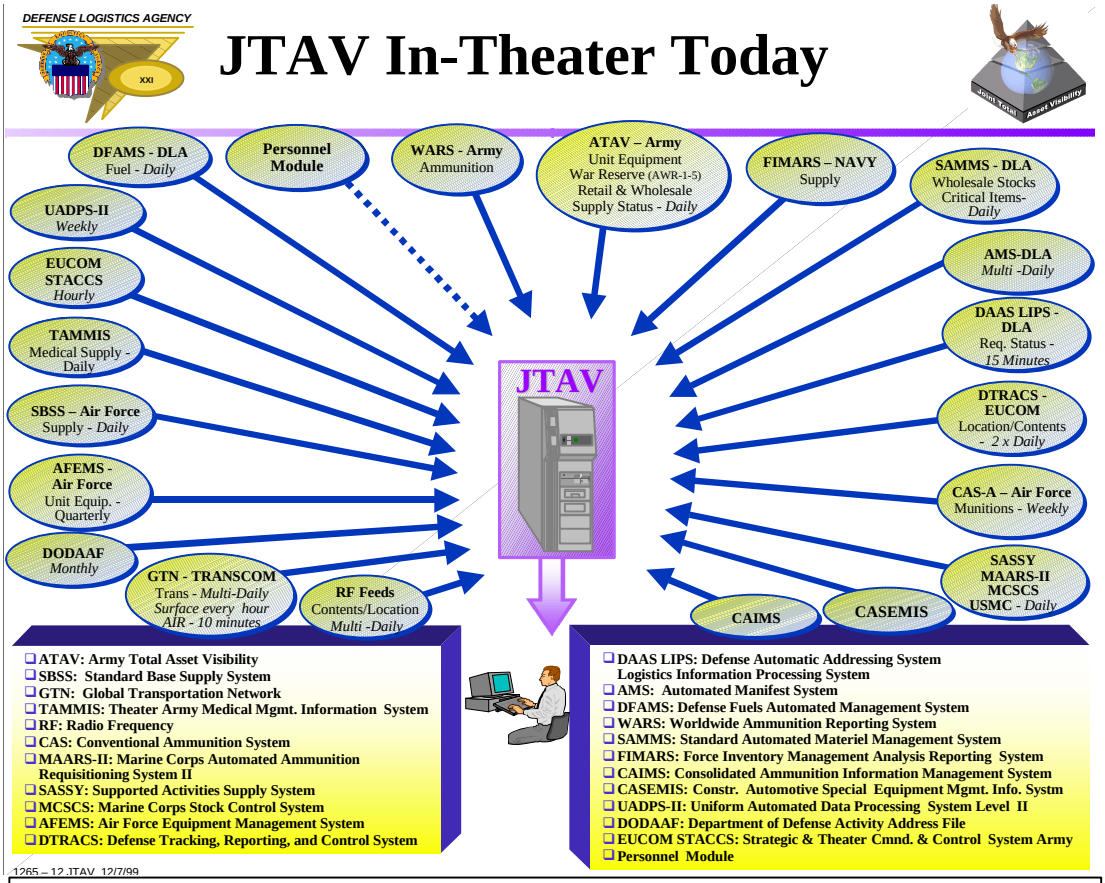


**Figure 2**

A user, by means of a user ID and password simply accesses the JTAV application via the web, selects a functional area (inventory, ammunition, war reserve, transportation, medical, etc.) and launches a query (asks a question).

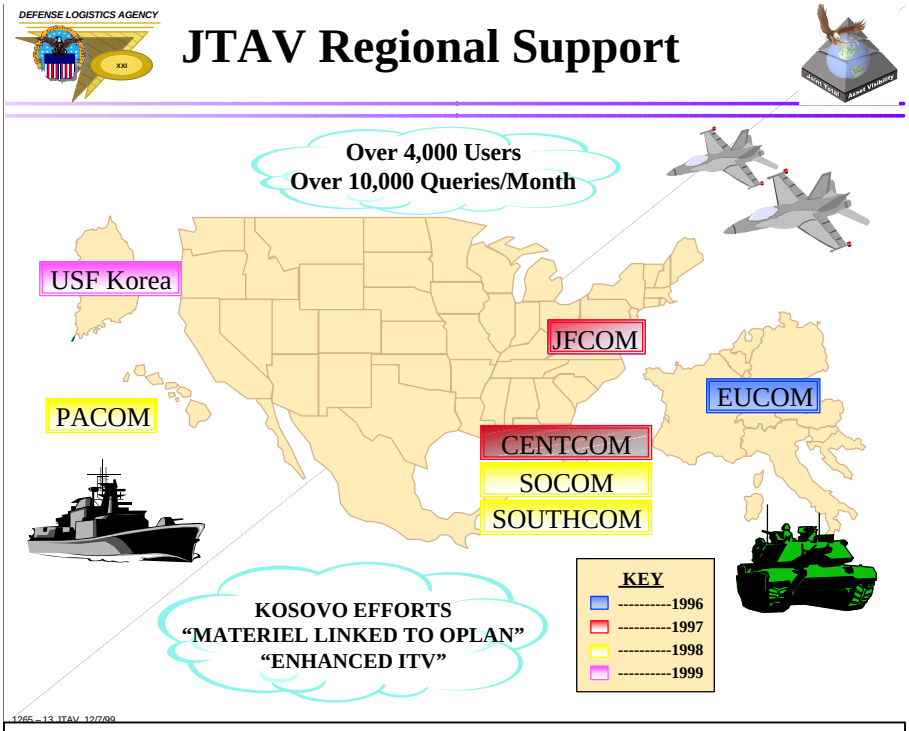


**Figure 3**

In a matter of seconds, the answer appears on the user's screen. For example, if a user wanted to know who had a particular NSN, he would simply enter the NSN as the "entry level argument," launch the query, and in a matter of seconds, the location and quantity of that NSN within the Army, Navy, Air Force, Marine Corps, and/or DLA inventories would appear on the screen. If one wanted to only see who in the Air Force had the item, the user would simply deselect the other services. Obviously, the data is only as accurate as what is put into the authoritative source, and as timely as the most recent update. The whole process is web-based, windows driven and quite intuitive.

## THE "OBJECTIVE" SYSTEM ARCHITECURE

The "objective" system architecture is currently being developed. This "objective" system architecture takes advantage of middleware technology whereby a piece of

middleware in response to a query submitted by a user, goes **directly** to the authoritative source. **One** example of middleware technology is a mediator and is depicted in figure 4. After directly accessing the authoritative source, the mediator then fuses, or consolidates that data within the mediator, before presenting the data back on the user's screen in a manner that answers the query. Unlike the "as is" system architecture where data are obtained through a data push, or pull FTP process, the "objective" system architecture obtains data in the following process:

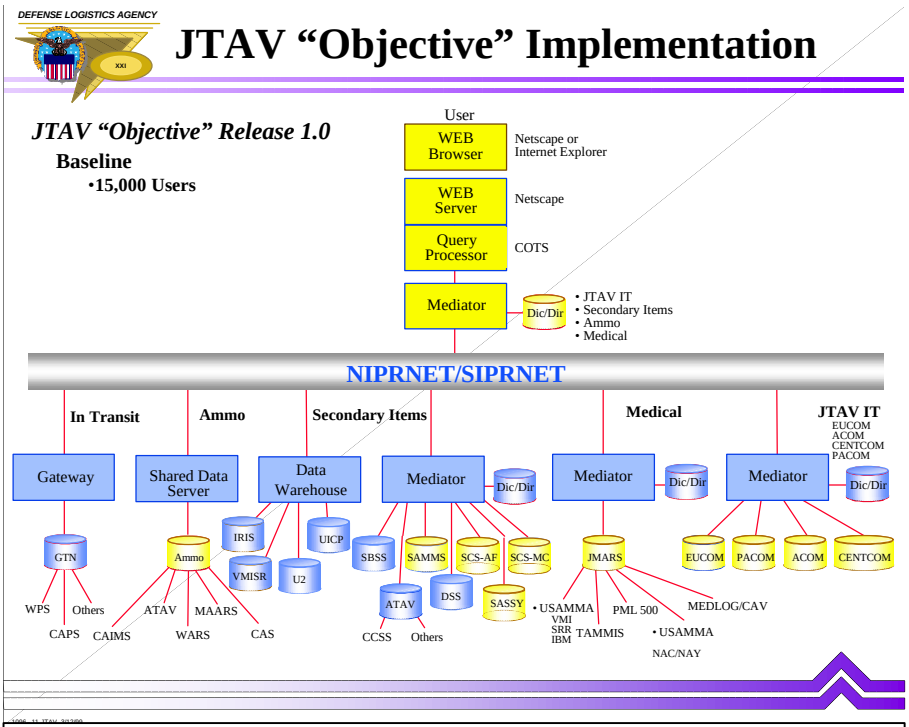


**Figure 4**

* A data dictionary **defines** all potential data in the environment.
* The directory identifies **where** the data resides (which of hundreds of authoritative sources) and explains how to translate the data in the view defined by the dictionary.
* The dictionary and directory are installed **in the middleware.**
* The middleware uses the directory to submit requests **to the data source** and present the data to the user.

By accessing the data at the authoritative source, the user has on line/real time information. Like the "as is" system architecture, unclassified communications is accomplished using the NIPRNET and classified communications uses the SIPRNET. (It should be noted however, that even on the unclassified NIPRNET, there are many layers of security inherent such as secure socket layers). In addition to accessing real time data from numerous sources and making the data available on a single platform, the JTAV objective architecture provides the consolidation of data into useful information whether the user represents the operational view of the warfighter, or the management view of the inventory control point and/or item manager.

Given time and performance issues, the question becomes, when is it appropriate to use a middleware solution to access the data? The answer is, "it depends". The appropriate solution is scenario driven. As a general rule, access to data utilizing middleware technology is appropriate when dealing with perishable, or dynamic data such as in-transit visibility data provided by GTN. Or, in those cases when near real-time information is essential for mission success. For more static data, such as catalog data, or routine inventory queries, the more sensible solution is to continue to receive data and store it forward in the server. In sum, a combination of several methods, hence the development and eventual fielding of an objective architecture that utilizes middleware technology, will not replace, but simply enhance the architecture outlined in figure 2.

## THE SERVICE'S ROLE IN JTAV

The Services and the Defense Logistics Agency's (DLA) role in the development of JTAV is obviously critical. In fact, the DLA is the executive agent for JTAV. Far from being a tool to replace the service and agency legacy systems, JTAV relies on those legacy systems! If the individual service and/or DLA choose to modify, or totally change their systems, JTAV does not care. JTAV's only interest is having data access to whatever system is ultimately chosen by the service or agency.

Access to the data contained in those systems is obtained via a disciplined process that centers around a Memorandum of Agreement (MOA) between the service or agency having responsibility for the system designated as the authoritative source, and the JTAV program office. While not all services, or DLA agencies have fully completed the MOA process, all have been providing some level of access to whatever system **they** identify as the authoritative source for the sought after data. The MOA's are required however, for both documentation purposes and the fact they specifically identify those essential elements of information (EEI's) jointly identified by the JTAV program office and the service/agency for total asset visibility. It is important to note that while the need to access certain EEI's is driven by requirements, it is the **individual service or agency,** not the JTAV program office that determines what the authoritative source for those EEI's will be. Completing the documentation process are Data Sharing Requests and Data Sharing Specifications which specify the operational agreements between the

service/agency and the JTAV program office as they relate to design, implementation, and management of the pertinent data.

## SUMMARY

Joint Vision 2010 is the template for how America's armed forces will dominate the battlefield of the 21st Century. This will be accomplished through information superiority and technological innovation and the resulting new operational concepts of Dominant Maneuver, Precision Engagement, Full Dimensional Protection, and Focused Logistics. Failure to achieve Focused Logistics, however, means failure for the other three concepts as well. Focused Logistics requires the fusion of logistical information, which in turn requires the sharing of logistical data across functional and service boundaries, which means JTAV. It follows, then, that JTAV is essential to the success of all the operational concepts set forth in JV 2010.

Numerous high level documents have already been cited that call for the development and implementation of JTAV. Services and agencies, historically protective of their data, are recognizing the reality of the joint environment in which we operate as well as the utility of a shared data environment, and continue to cooperate by providing access to their respective legacy systems. It should be noted however, that visibility of asset information does not necessarily equate to access to those assets. It does however, equate to **potential** access. Obviously, business rules and agreements must be negotiated. But,

by leveraging the visibility JTAV provides across service and functional boundaries, the possibilities for a more efficient and effective total logistics enterprise are many.

Briefings, demonstrations, training and access to JTAV have been provided to numerous units throughout the world. Likewise, in an effort to institutionalize the JTAV capability, similar initiatives have been undertaken with such activities as the Army managed Joint Course on Logistics at Ft. Lee VA. The Marine Corps, in particular has been quite successful in getting the JTAV capability in the hands of its logisticians as well as embedded in many of its formal schools.

For those desiring information about the JTAV capability, or access, contact the JTAV Program Office Director, Ms. Nancy Johnson at COM 703-428-1081 (x 100) or DSN 328-1081. Additional information is available on the JTAV web site at www.acq.osd.mil/log/jtav.